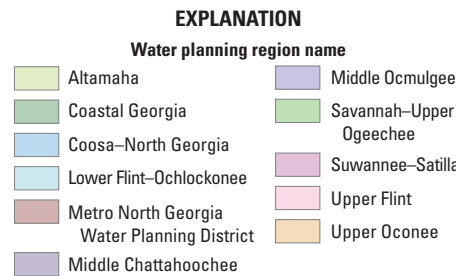
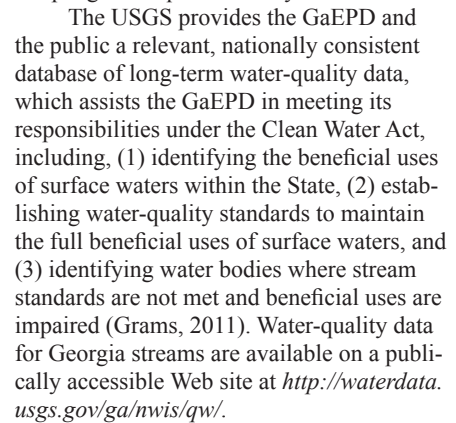
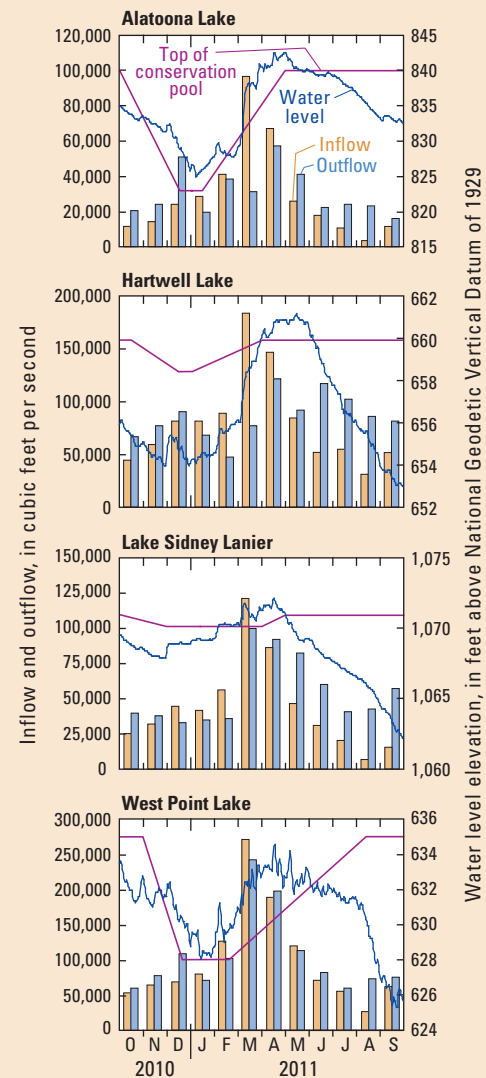


Major lakes and reservoirs throughout Georgia are managed primarily by the U.S. Army Corps of Engineers and Georgia Power Company to provide water for public and industrial use, flood protection, power generation, wildlife management, and recreation. Managing lakes and reservoirs requires computer models that rely on USGS data to predict changes in climate and water demands.

Allatoona Lake is on the Etowah River and is managed by the U.S. Army Corps of Engineers. During the 2011 WY, Allatoona Lake remained above or just below the top of conservation pool from October through June. By the end of the 2011 WY, the lake level was nearly 7 feet below the top of conservation pool, as outflow was 2.4 times greater than inflow from July through September.



5

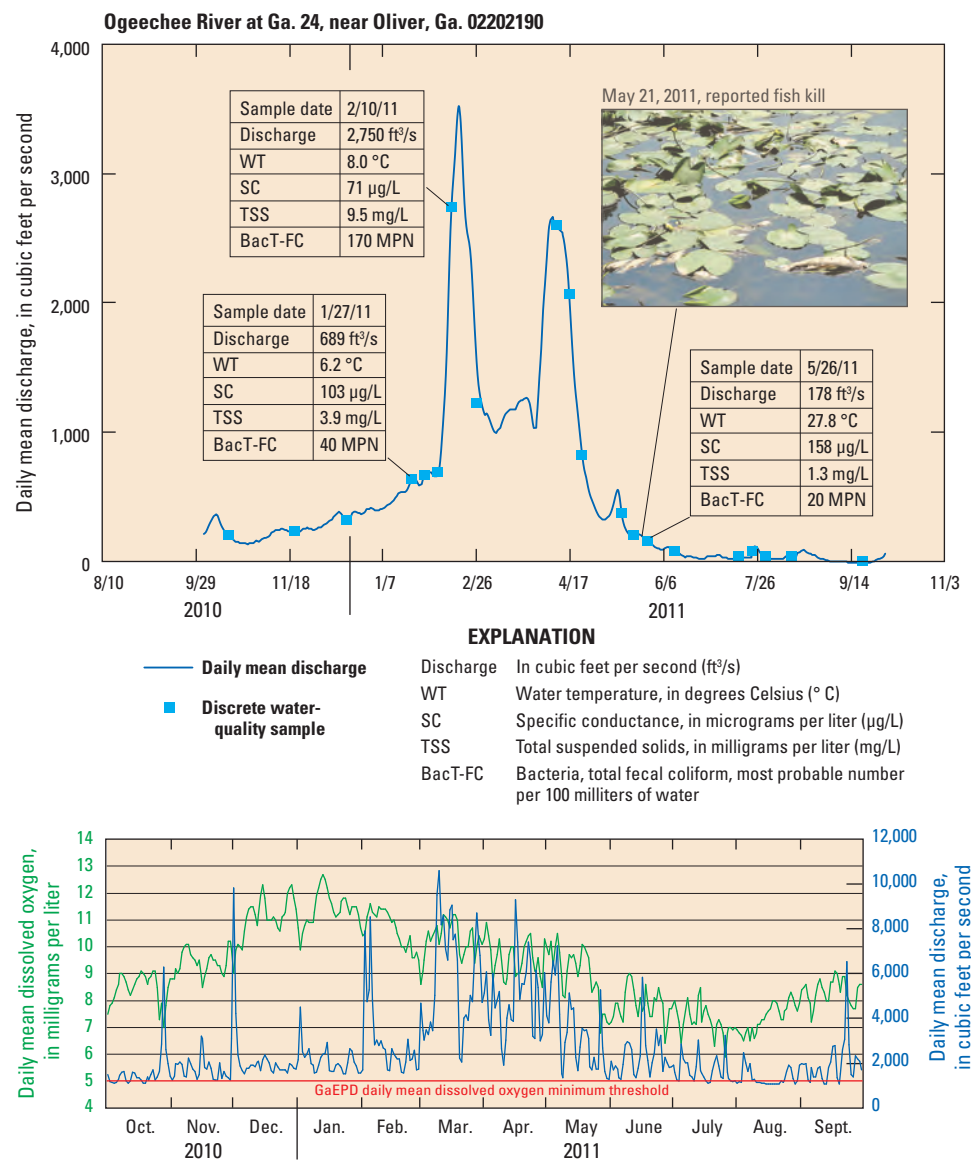
The USGS–GaEPD cooperative program collects continuous water-quality data at three sites in Georgia, including USGS station 02337170 Chattahoochee River near Fairburn, Ga. This stream reach is classified as “Fishing” under Georgia Code 391-3-6-.03 “Water Use Classifications and Water Quality Standards,” which requires that the daily mean dissolved oxygen (DO) concentrations in the stream remain at or above 5.0 milligrams per liter (Georgia Environmental Protection Division, 2011a). The daily mean DO and daily mean discharge for the Chattahoochee River near Fairburn, Ga., is shown in graph (bottom right) for the 2011 WY. No daily mean DO levels fell below the “Fishing” criteria in Georgia streams during the 2011 WY.

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On August 31, 2011, the Office of the State Climatologist reported extreme drought conditions in almost all areas of Georgia south of the Georgia mountains and that all counties in Georgia were classified as being in moderate, severe, or extreme drought. Also reported were soil moistures at the fifth percentile, indicating that, statistically, soils would have more moisture 95 out of 100 years based on historical data. Wildfire danger was rated from high to extreme by the Georgia Forestry Commission, and in August 2011 Georgia had twice as many acres of scorched land compared to the long-term August average (Stooksbury, 2011). The GaWSC network reported several streamgages with 20 or more years of record experiencing record low flows, including 02202500 Ogeechee River near Eden, Ga., 02226000 Altamaha River at Doctortown, Ga., and 02353000 Flint River at Newton, Ga. Also, several streamgages recorded no

U.S. Geological Survey, 2012a) were used to develop this summary. Data for WYs 1999–2011 can be accessed online at <http://ga.water.usgs.gov/publications/pubswdr.html>. At this Web site, a digital map allows the user to search for current and historical data and graphics collected as part of the USGS monitoring network.

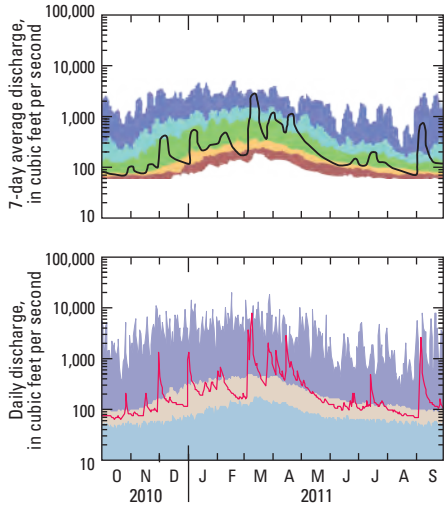
These maps represent hydrologic conditions during the 2011 WY compared to available historical data. The colors represent runoff (flow per unit area) as a percentile of long-term averages. Runoff was calculated for each basin and assumed to be uniform over the entire basin area. Only streamflow stations with a complete daily-flow dataset for the 2011 WY were used (U.S. Geological Survey, 2012c). For the first quarter of the 2011 WY (October–December 2010), much of the State was observing “below normal” and “much below normal” runoff conditions as a result of extreme temperatures and lack of precipitation during the preceding summer months of the 2010 WY (4). Little to no precipitation kept the majority of the State in drought during the second and third quarter of the 2011 WY (B, C). After receiving 50–75 percent of normal precipitation from central Georgia to Florida during the 2011 WY, the majority of the State was in an extreme drought during the fourth quarter as runoff was “much below normal,” and large areas of the State observed some of the lowest runoff conditions on record (D).

New record-low 7-day average discharge occurred at 24 of 113 streamgages that have 20 or more years of data in 2011. The majority of these streamgages were located in southern Georgia



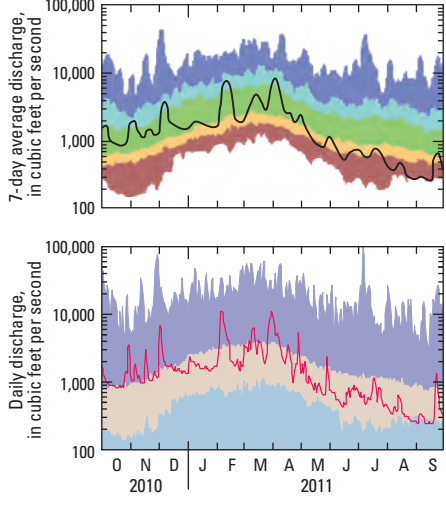
Chattanooga River at Summerville, Ga. 02398000

The Chattanooga River flows in the northwestern corner of Georgia and into Alabama where it flows into Weiss Lake (U.S. Geological Survey, 1975). The northwestern corner of Georgia received 90–110 percent of normal precipitation in the 2011 WY. Daily discharge and 7-day average streamflow for the 2011 WY was predominately in the “normal” range.

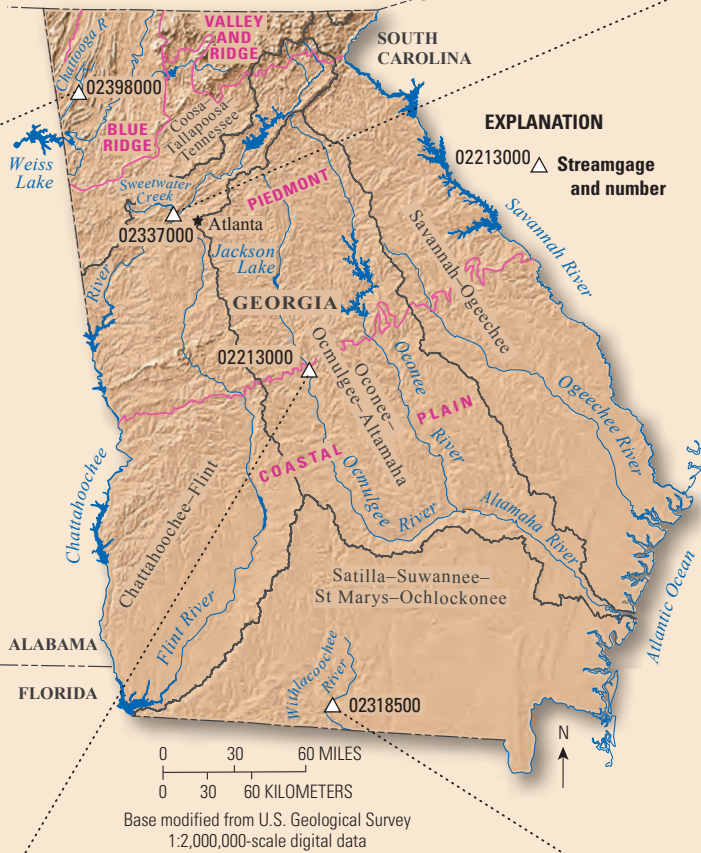


Ocmulgee River at Macon, Ga. 02213000

The Ocmulgee River flows out of Jackson Lake and joins the Oconee River to form the Altamaha River (U.S. Geological Survey, 1975). The 7-day average streamflows were mostly in the normal range from October through March. After an extended period of lower-than-normal precipitation, streamflows were “much below normal” for the remainder of the 2011 WY and came close to setting new record lows. Daily discharge remained near historical median flows for most of the 2011 water year.

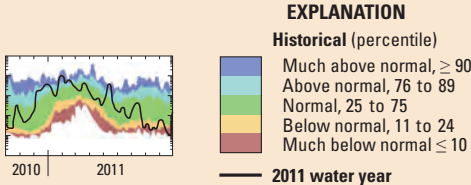


Daily Discharge and 7-Day Average Streamflow Conditions, 2011 Water Year



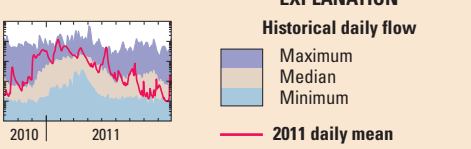
7-Day Average Discharge

Hydrographs show 2011 daily-mean streamflow, in cubic feet per second, as compared to historical minimum and median streamflow for the entire period of record (U.S. Geological Survey, 2012a).



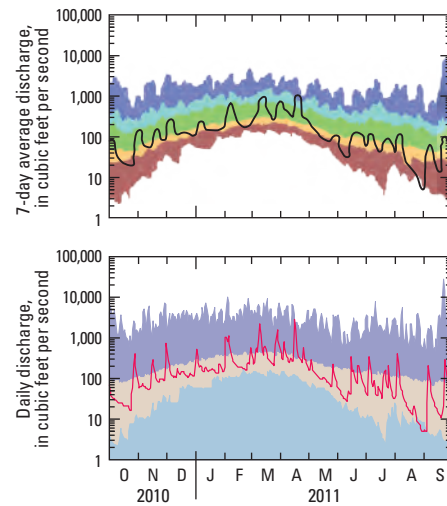
Daily Discharge

Hydrographs show the 7-day average for 2011 as compared to historical 7-day averages. Data are categorized in percentile ranges from “much above normal” (greater than the 90th percentile) to “much below normal” (less than the 10th percentile) (U.S. Geological Survey, 2012a).



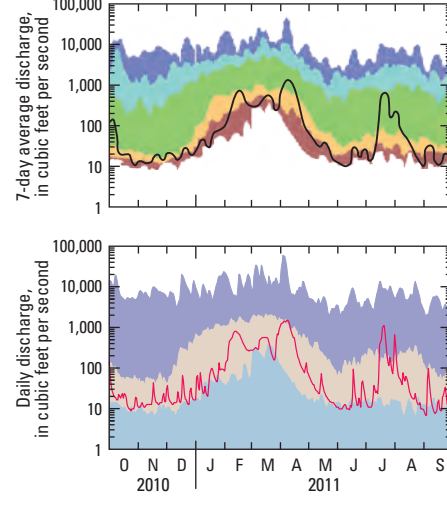
Sweetwater Creek near Austell, Ga. 02337000

Sweetwater Creek is a major tributary of the Chattahoochee River (U.S. Geological Survey, 1975). The 7-day average streamflow fluctuated between “normal” and “much below normal” from October through April gradually declining to “much below normal” during the latter part of the 2011 WY as the area received 10–20 percent below-normal precipitation. Several daily discharges reached new record lows during the months of August and September.



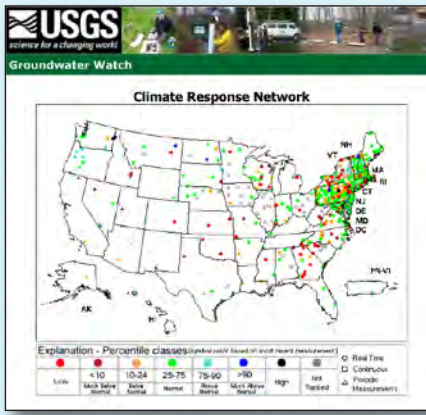
Withlacoochee River at US 84 near Quitman, Ga. 02318500

The Withlacoochee River flows in the Ochlockonee River basin in the southern coastal plain of Georgia (U.S. Geological Survey, 1975). For most of the 2011 WY, 7-day average streamflow conditions were “below normal” to “much below normal” and came close to the record low recorded in 1940. Several daily discharges reached new record lows during the months of January, May, June, July, August, and September.

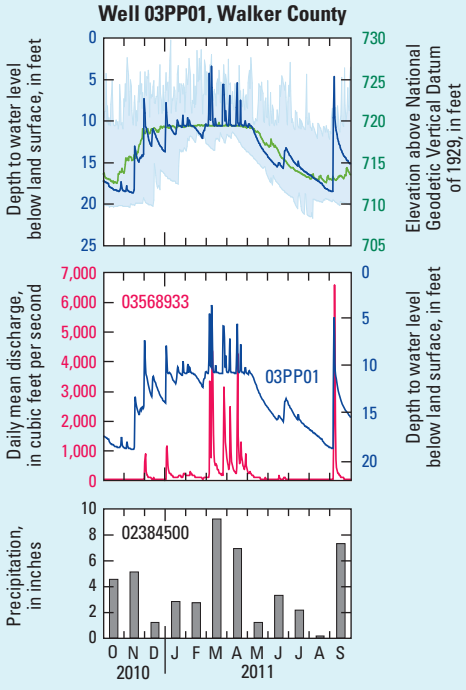


Climate Response Network

The USGS maintains a network of groundwater wells to monitor the effects of droughts and other climate variability on groundwater levels. These wells are part of the Climate Response Network, which is designed to measure the effects of climate on groundwater levels in unconfined aquifers or near-surface confined aquifers where pumping or other human influences on groundwater levels are minimal (U.S. Geological Survey, 2007, 2012b). The national network consists of about 130 wells, of which 15 are located in Georgia. These wells are monitored as part of the USGS Groundwater Resources and Cooperative Water Programs. Current conditions of groundwater wells in the Climate Response Network can be accessed online at <http://groundwaterwatch.usgs.gov>. The hydrographs presented are for selected wells in Georgia with at least 5 years of continuous data.

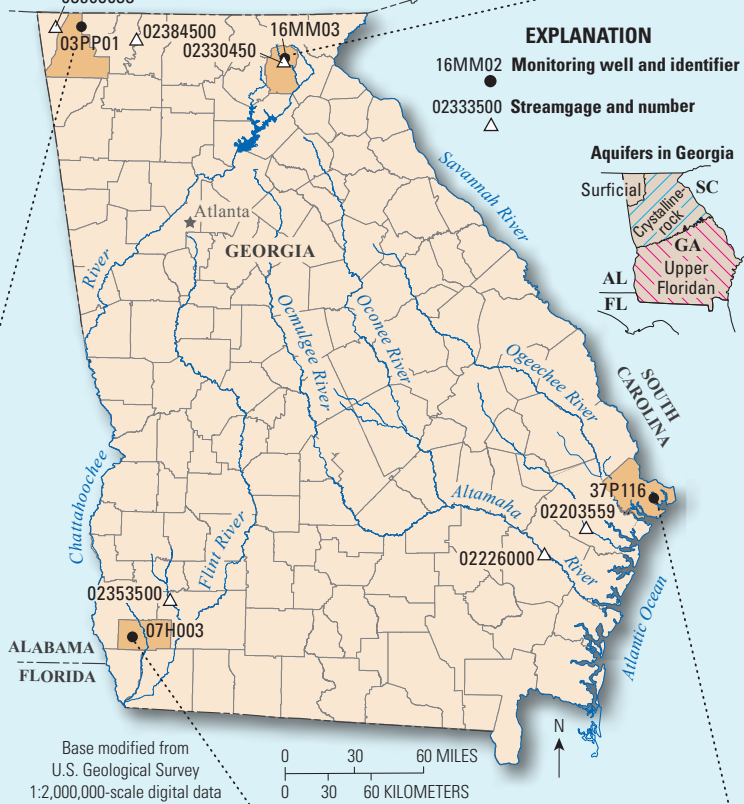


Well 03PP01 is in Walker County in southwestern Georgia and is completed in the surficial aquifer, which is an unconfined aquifer in this area (Peck and others, 2011). The water level in this well generally rises rapidly during wet periods and declines slowly during dry periods. The water level in well 07H003 responds to seasonal change similarly to streamflow at the nearby streamgage on Lookout Creek near New England, Ga. (03568933), which indicates atmospheric, surface-water, and groundwater interactions. The water level in well 03PP01 was near the historical daily median for much of the 2011 WY.

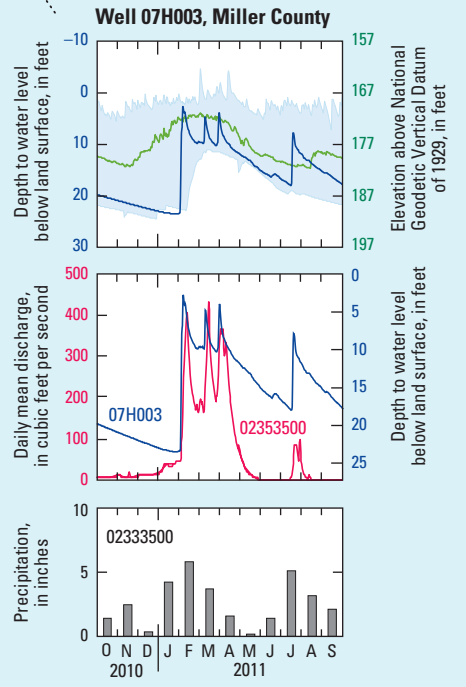


Georgia's Climate Response Network

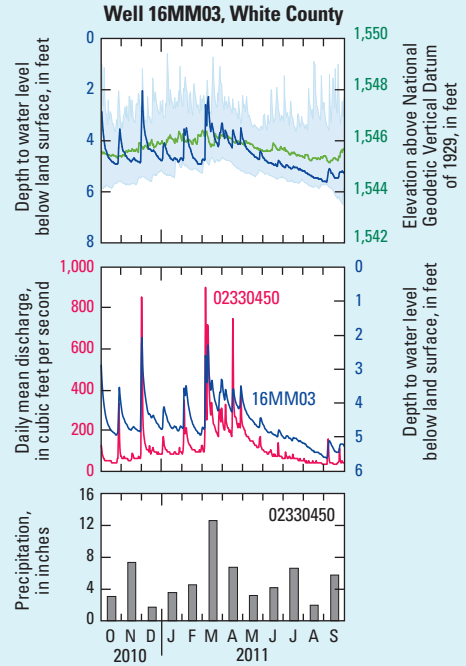
The hydrographs presented are for selected wells in Georgia with at least five years of continuous data.



Well 07H003 is in Miller County in southwestern Georgia and is completed in the surficial aquifer, which is an unconfined aquifer in this area (Peck and others, 2011). The water level in this well generally rises rapidly during wet periods and declines slowly during dry periods. The water level in well 07H003 responds to seasonal change similarly to streamflow at the nearby streamgage on Ichawaynochaway Creek at Milford, Ga. (02353500), which indicates atmospheric, surface-water, and groundwater interactions. In the 2011 WY, water levels in well 07H003 were below the historical daily median for much of the year. For a brief period in January 2011, the daily mean water level fell below the historical daily minimum water level.



Well 16MM03 is in White County in northeastern Georgia and is completed in the crystalline-rock aquifer. Water is stored in the regolith and fractures, and the water level is affected by precipitation and evapotranspiration (Cressler and others, 1983). Precipitation can cause a rapid water-level rise in wells tapping aquifers overlain by thin regolith (Peck and others, 2011). The water level in well 16MM03 responds to seasonal change similarly to streamflow at the nearby streamgage on Chattahoochee River at Helen, Ga. (02330450), which indicates atmospheric, surface-water, and groundwater interactions. The water level in well 16MM03 remained below the historical daily median for much of the 2011 WY.



Well 37P116 is in Chatham County in southeastern Georgia and is completed in the surficial aquifer. Water levels in this well generally rise rapidly during wet periods and decline slowly during dry periods. The water level in well 37P116 responds to seasonal change similarly to streamflow at the nearby streamgage on Peacock Creek near McIntosh, Ga. (02203559), which indicates atmospheric, surface-water, and groundwater interactions. The water level in well 37P116 fluctuated above and below the historical daily minimum for most of the 2011 WY.

